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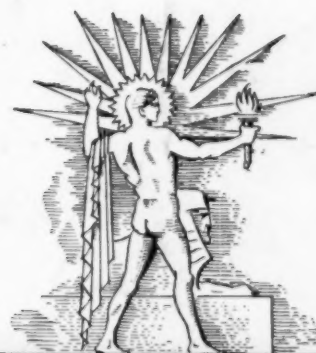
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# SCIENCE NEWS LETTER

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



September 14, 1940

Prize From Africa

See Page 169

A SCIENCE SERVICE PUBLICATION

## Do You Know?

More than 2,000 years ago, Egyptians and Chinese knew how to hatch chicks by *artificial* heat.

A Swiss physicist has invented an electric spray gun for spraying extremely *hot metal* for a surface coating.

A very large and complete *wind tunnel* being built at the Lockheed Aircraft factory in Burbank, Calif., will cost \$150,000.

A *water* route from Odessa to Danzig has been completed, enabling barges to carry trade goods between southern Russia and Germany.

The Amur cork tree, introduced from Asia for ornamental purposes, yields a quick-acting insect *poison* which may have commercial use.

Progress in breeding *Notail* sheep which require no docking but retain good mutton and wool qualities is reported by South Dakota agricultural scientists.

The first *Russian* attempt to analyze American folklore scientifically will appear in a history of American literature, undertaken by the USSR Academy of Sciences.

Lions do not cling so rigidly to their jungle behavior as has been popularly supposed, but *change* their habits considerably with environment, studies by University of California psychologists indicate.

## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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The *damask* rose is a native of Asia Minor.

*Muskrats*, sometimes rated as silent animals, make chattering and squeaking sounds with their teeth.

A survey of 16 counties in Indiana showed that the children listen to the *radio* on an average of about two hours a day.

Canada's young plastic *casein* industry is now producing rennet casein suitable for plastics.

The farthest that a starfish has been known to travel was less than a mile, and it took *10 months*.

Indians of almost 40 tribes compete in dances, sports, and handicraft at their annual *gathering* in Gallup, N. M.

## SCIENCE NEWS LETTER

Vol. 38 SEPTEMBER 14, 1940 No. 11

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienservice, Washington.

Entered as second class matter at the post-

office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark. U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at \$3 a year.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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## MATHEMATICS

# Electric Calculating Machine Devised For Complex Problems

Made of Standard Telephone Switchboard Parts, Robot  
Receives and Answers Problems Over Long Distance

**F**OR THE FIRST time in mathematical history, problems can be solved by long distance teletyping.

A new electrical computing robot, synthesized out of standard telephone dial switching equipment, had complex mathematical problems punched into its keyboard in Hanover, N. H., solved the problem in its electrical brain in New York City and teletyped the answers back to appreciative mathematicians at Hanover.

The inventor of the machine, Dr. G. R. Stibitz of the Bell Telephone Laboratories, told the Mathematical Association of America about his electrical mathematical prodigy and asked the members assembled in a Dartmouth College lecture room to write out their own problems on the machine. The answers rattled back in less time than any human being could solve them. And they were free from the inaccuracies that human frailty sometimes commits.

Over a year ago mathematicians of the Bell Telephone Laboratories, charged with designing thousands of intricate circuits and pieces of apparatus through use of complex mathematical methods, felt the need of a new kind of calculating machine to solve their particular needs. Instead of making it mechanically out of gears, cams, etc., they turned

## ELECTRICAL MATHEMATICS

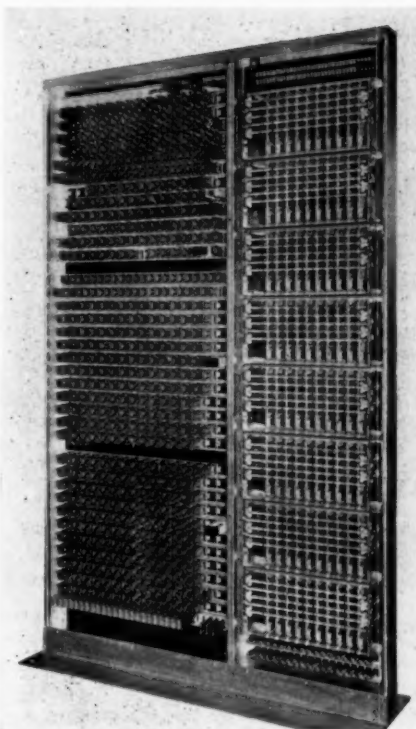
*Computations by the new Bell Telephone Laboratories electrical computer are neat and accurate. Complex numbers, consisting of a real and an imaginary number, were multiplied and then the result was divided by one of the numbers to obtain the other. Note that the divisor was written before the dividend. This is done to allow the brain of the computer to get to work immediately after half of the second number is written, instead of having to wait until the whole number is completed. The last line proves that the machine knows simple arithmetic also. The way the machine was set up forced it to solve the problem as  $.2 \times .2$ , which is  $.04$ .*

to the intricate electrical relays and cross-bar switches used to connect subscribers in the most modern dial telephone exchange. These relays became the computing mechanism. For the controlling mechanical-electrical brain, a teletype such as used by the thousands in business and telegraph offices was impressed inside service. The keyboard used is the one that the operator of a manual exchange uses to dial a number on a dial exchange.

With the encouragement and cooperation of Dr. Thornton C. Fry, Bell Laboratories mathematics research director, and the expert knowledge of Samuel B. Williams, switching development engineer, Dr. Stibitz had his robot completed and working successfully in about six months. The robot has been a very useful member of the mathematics computing staff for another six months, during which it has been put through its paces and has made good.

If the mathematical problems needing solving were simple ones, the Bell Telephone Laboratories would not have gone to the trouble of building a new kind of computer, costing somewhere in the thousands of dollars. In designing electrical apparatus, especially the sort that keeps long distance telephony distinct and useful, it is necessary to use the kind of numbers that even mathematicians call "complex."

To a mathematician a complex number is not just one that is long and complicated. It is a number that contains as part of it an "imaginary number." Perhaps you remember from your algebra that no one can ever find the square root of minus 1; for example, minus 1 multiplied by minus 1, under the rules of algebra, gives plus 1, not minus 1. It suits the convenience of some problems to use the square root of minus 1. So the mathematicians invented it, called it an imaginary number and



NOT VERY SPECTACULAR

*This is the "brain" of the new electric computing machine. It looks rather like the insides of an ordinary telephone switchboard, but it is so constructed as to perform complex mathematical operations in a fraction of the time that it would take a human brain.*

agreed that it would be written "i".

The imaginary numbers or *i* numbers are very useful in handling alternating current problems, making them mathematically as simple as direct current problems. Filters and equalizers for long distance lines could not be designed without imaginary numbers. Over a dozen physicists and as many mathematicians and computers work on such problems all the time at Bell Telephone Laboratories, where the research for the nation's telephone companies is done.

For the present, at least, you will not be able to dial 211 and ask Long Distance to do your math problems for you. The electrical computer was made for use on the Bell Laboratories' own problems. The one machine constructed so far, when it gets through its demonstrations, will be fully occupied with real computing work already in sight.

Because imaginary numbers are being used in aircraft design and in geophysi-

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cal prospecting for oil, this kind of machine may find use in other industries.

Its application to the Bell Laboratories work will be facilitated by the installation of special teletypes in all the computing rooms. Mathematicians will be able to walk across the room, type their problems and get the answer promptly.

The machine does the average problem in a third of the time taken by present methods using conventional computing machines. It multiplies twice as fast but divides about four times as

fast. Computing work on a long-distance lines problem, for instance, usually requiring six months will be done in six weeks.

Mathematicians will be interested in knowing that part of the design of the machine was worked out by means of Boolean algebra, a newer kind which has also proved useful in symbolic logic.

The machine has not received a nickname as yet. Since it deals with imaginary numbers, it may answer to the name of "Yehudi."

*Science News Letter, September 14, 1940*

#### PUBLIC HEALTH

## Mosquitoes Kept Suppressed On South's Eight New Lakes

**E**IGHT new lakes, formed by the eight great dams of the Tennessee Valley system, have become health and pleasure resorts as well as sources of wealth and power for the nation because the malaria-carrying mosquitoes are not permitted to breed in the shallow waters along their shores. Workers in shallow-draft boats, in low-flying airplanes, trudging along on foot, patrol every spot where the malevolent insects might lay their eggs, and prevent their coming with clouds of poison dust.

When the new lakes are all filled to normal height they lap shorelines totaling some 5,000 miles, or 25 times the shoreline length of the Panama Canal. Not a mile can be neglected, either, for the lakes lie in seven states that have in past times been known as the heart of the malaria belt.

Control of mosquitoes (and hence of malaria) in the Valley is the fruit of painstaking preliminary research, participated in by the U. S. Public Health Service, the Bureau of Entomology and Plant Quarantine of the Department of Agriculture, and the Rockefeller Foundation. Several steps in control were found necessary, and all have been most thoroughly carried out.

First came a complete clearing away of all bushes and other growths along the zone over which the water level fluctuates, as the dams are first closed for filling, then opened to maintain navigation heights in the streams and to develop power. Malaria mosquitoes love to lurk and breed in such sheltered places, and that part of the shoreline had to be shaved clean. It cost money at first, but saved heavily on poison dust expenditures later.

A second element in the new technique was a radical departure in the schedule of pool level fluctuation. The purposes of flood control, power and navigation would not always permit fluctuation of the pools at the times when the variation was most needed for mosquito control. Early in the construction program the Health and Safety Department succeeded in obtaining the addition of one foot (called the "malaria control surcharge") to the heights of the dams.

Starting at the beginning of the mosquito-breeding season, the pool level is varied once every week or ten days—first to the maximum and then down to the minimum, each succeeding time falling slightly short of the preceding maximum.

In this way the pool level is kept always a little ahead of the encroaching vegetation.

Finally comes dusting of mosquito-breeding waters with Paris green, diluted with soapstone, so that only half a pound of the poisonous green powder is spread per acre of water treated. Airplanes are much used: in 1939, pilots flew more than 300 hours to spread more than 100 tons of dust over 82,000 acres of lake shore. Boats with oil sprays are also in use, and men on foot to get at the less accessible places. Lately, copper arsenite has been found quite as effective as Paris green, and only about half as expensive.

Public health officers keep close track of the incidence of malaria in the Valley. Every year they make approximately 20,000 blood examinations, from samplings of the population. In the area as a whole the number of malaria cases has already been reduced.

*Science News Letter, September 14, 1940*

#### INVENTIONS

### Small Centrifugal Pump Efficient in Operation

**A** SMALL centrifugal pump for light liquids, that handles surprisingly large quantities despite its size, weighs only six pounds. (Eastern Engineering Company.) It is made of monel metal, stainless steel and chromium-plated bronze construction, and will be especially useful where weight and space for the pump must be kept at a minimum.

*Science News Letter, September 14, 1940*

Seals are good divers, and can stay under water for 12 to 15 minutes.



#### THIS IS WAR

But war of a kind that everybody applauds, for the man in the boat is "blitzing" the breeding places of malaria mosquitoes along the shallow lake shore with a cloud of poison dust. More than 5,000 miles of shoreline, along the Tennessee Valley's new lakes, are thus protected for the health and comfort of resorters as well as permanent residents.

## PSYCHOLOGY

# Recovered Patient Re-lives Experience in Sanitarium

## For the Sake of Science, Psychologist Returns To Scene of Her Sufferings From Mental Illness

**T**HE STORY of a young woman, recovered from a severe mental illness, who went back to the ward where she had been most violent to re-live her experiences for science was related before the meeting of the American Psychological Association. The psychologist making the report was the same woman who had had this dramatic experience, Dr. Elaine F. Kinder, now at Letchworth Village, Thiells, New York.

On first recovery, Dr. Kinder's only memory of the period was "a hazy recollection of extreme noise and confusion." Gradually, little islands of events stood out in the general fog in which her memory had been lost. Details of what had happened to her seemed to be completely forgotten.

Fifteen months later, because of her professional training and experience, Dr. Kinder decided, for the sake of better understanding of mental illness, to make a strenuous effort to regain her memory of those very painful experiences.

She secured the cooperation of the hospital, and her physician, Dr. J. A. Kindwall, made available to her the notes and records of her case. Reading of these served to "touch off" certain memories, but even then most of the long time remained a confused blank to her. At last she secured permission to go back and spend 24 hours in that same "disturbed ward" where she had been at her worst. She was to sleep in the very same bed.

"The effectiveness of the visit was far beyond all expectation," Dr. Kinder reported. "It started an almost overwhelming flood of extremely vivid memory."

First to return were the intense emotions she had felt during that time. These awoke in her recollection of what she had done and events that had happened.

The sight of a ventilator brought vivid recollection of the feelings and ideas in which that ventilator had played a part. It was only incidentally that she remembered climbing up to reach it. In contrast, nurses remembered clearly the incident of her climbing, but of course had no knowledge of the flight of ideas and emotions which had so much more meaning to the patient.

These factors that give meaning to an incident are basic to recall, Dr. Kinder concluded from her experience.

*Science News Letter, September 14, 1940*

## War Attitudes Explained

**E**XPLANATION of the long fight in Congress over the selective service legislation may be found in a report to the meeting by Dr. George W. Hartmann, of Teachers College, Columbia University.

On the day that Hitler's army split the Anglo-French forces and reached the Channel port of Abbeville, Dr. Hartmann was giving a final examination in a course in social psychology. The students were college graduates, many of them experienced teachers. He asked them as part of the examination to explain in detail why they were or were not absolute pacifists. Nine were absolutely and unconditionally opposed to war in any form. The other 30 did not hold this view.

The opposition of the two viewpoints Dr. Hartmann found to be clear and impressive. Both pacifist and non-pacifist use religious and Christian sanctions with contradictory results. Pacifists emphasize that maintenance and enlargement of life for themselves and others is the highest value known to man for without it no other values have any meaning. Non-pacifists repeatedly declare that war is for them a lesser evil.

"Like the man about to commit suicide or murder," said Dr. Hartmann, "they maintain that the absence (or presence) of certain conditions makes life unbearable for them—they prefer to suffer extinction rather than adjust to these demands. Apparently the non-pacifist is more severe than the pacifist in the demands he makes upon the world before he will consent to be active in it."

*Science News Letter, September 14, 1940*

## War Increases Stuttering

**I**F WAR comes to America, it will probably produce a great increase in stammering, stuttering and mutism, Dr. Sara

Stinchfield-Hawk, of the University of Southern California, told colleagues in her address as president of the American Speech Correction Association.

Even though American cities may never be bombed, and American soldiers never see actual combat service, Americans will still be liable to the war-caused nervous diseases which produce speech defects, Dr. Stinchfield-Hawk indicated.

"We no longer speak of shell-shock," she said, "but of war-shock, and we find that the majority of nervous patients in our veterans' hospitals were, and still are, those who did not go overseas, were never subjected to bombardment, and never got beyond the officers' or regular training camps."

When fear and anxiety override the power of self-criticism, Dr. Stinchfield-Hawk indicated, the individual may become hysterical and start to stutter, stammer, or suffer from other speech defects.

*Science News Letter, September 14, 1940*

## Psychological Aids to War

**N**EW, SECRET psychological aids to war will be invented as the result of a mobilization of psychological brains for defense being arranged at the psychological meetings.

One of the first tasks of experts planning to go to Washington will be devising new psychological devices to speed up training in the use of the new tools of war. Modern warfare, leaders explain, with parachute troops, tank units and blitzkriegs, makes new demands upon the human mind and character.

As an example of what can be done, psychologists point to the method of training gun pointers developed for the U. S. Navy during the last World War by Prof. Raymond Dodge, Columbia University psychologist, a device still in use and still kept a military secret.

Defense against the war of nerves will be the problem attacked by one committee of the National Research Council, membership in which is being discussed. This committee on morale will plan how to keep civilian as well as Army nerves steady and spirits up in the face of attack from the propaganda front.

Action for defense was taken recently by psychologists of four national scientific societies, including the American Psychological Association. Representatives are being selected by the psychological organizations to go to Washington and serve on a joint committee with the National Research Council to advise the Army, Navy, the National Defense

Advisory Commission and other government agencies.

Army officers may call on this committee of experts to develop new methods for training green recruits in the techniques of mechanized warfare.

*Science News Letter, September 14, 1940*

## Poll Follows Campaign

**T**HE VOTE-changing effect of speeches by Willkie, Wallace, and other campaigners will be measured by periodic interviews of the same sample of 600 people, to be conducted by Dr. Paul F. Lazarsfeld, of Princeton University.

Details of this novel sort of political poll were explained by Dr. Lazarsfeld before the joint meeting of the American Psychological Association and the Society for the Psychological Study of Social Issues.

Questions will be asked of these 600 people about their opinions and expectations of the candidates and issues. Whenever anyone indicates that he has changed views since the last interview, an attempt will be made to find out just what brought about the change of heart.

Training methods have been specially developed for eliciting these reasons for change. In order to make sure that the interviews themselves are not the cause of a change, comparison will be made with the views of another set of "samples" consisting of persons who will be interviewed only once.

*Science News Letter, September 14, 1940*

## Radicals Are Young

**T**HE TYPICAL radical was pictured for members of the American Psychological Association by the report of Dr. Goodwin Watson, of Teachers College, Columbia University. This composite portrait was made up by Dr. Watson's study of those unemployed applicants at the Adjustment Service in New York who expressed themselves as holding radical views.

The radical, he found, is probably

young and without dependents. He is likely to be the native-born child of foreign-born parents. He is superior in intelligence and education. He is more likely to be in artistic or professional work than he is to be in business. He is most likely to be non-religious or Jewish; least likely to be a Catholic.

Men are not any more likely to be radical than women. Length of unemployment has nothing to do with radicalism. Radicals are no more likely to be unhappy than are conservative persons.

*Science News Letter, September 14, 1940*

## Anger Bad for Ulcers

**I**F YOU have a stomach ulcer don't get mad.

For such a patient, anger will bring on severe pain, increased acidity in the stomach and even bleeding. Drs. Bela Mittelmann and Harold G. Wolff, of New York Hospital and Cornell University told the Association.

Stomach ulcer patients and those with nervous indigestion, these investigators found, have their symptoms occur in connection with threats to their success or to their need for esteem, devotion at home, and "mothering." Typical cases were a man whose wife humiliated him, one whose mother had told him to leave home, and another about whom the neighborhood was gossiping. Such conditions lead to resentment and anxiety.

Even a discussion about their emotionally charged affairs would bring on effects that could be measured in the laboratory by means of a tube to the stomach, swallowed balloons, and devices

for recording breathing and finger-tip temperature.

Symptoms were most marked during the sleep that followed the occasion for the patient's anger.

When the patient is continuously worried or has protracted though less violent anger, he suffers from a prolonged increase in the stomach acidity.

For the peptic ulcer sufferer, all this pain, hyperacidity and tension could be reduced by anything that would give him relief from the stress at home or at work and by a little more feeling of security.

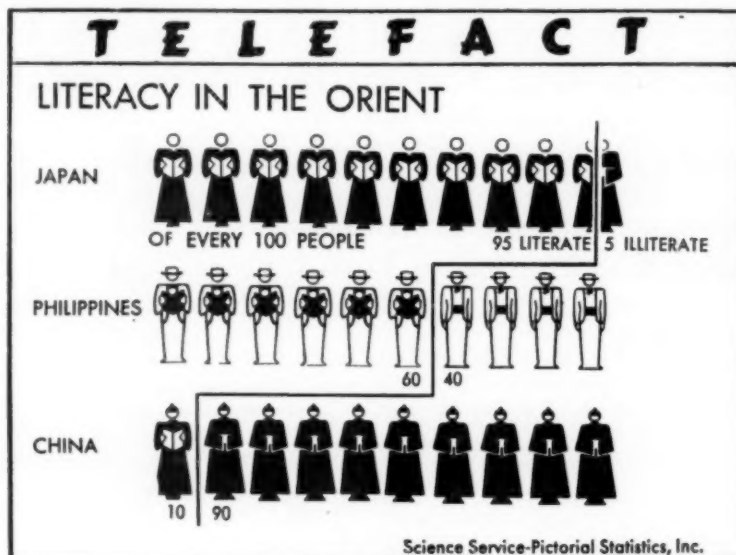
*Science News Letter, September 14, 1940*

## Brain Waves and Tantrums

**W**HEN a child lies or steals or has temper tantrums, it may be because his brain works slowly, Dr. Donald B. Lindsley, of Bradley Home and Brown University, reported. The slowness is in the working of the brain cells; the child is not necessarily slow-witted.

This clue to one of the reasons why children become problems was revealed when Dr. Lindsley and Dr. Katherine K. Cutts compared the brain waves of problem children with those of normal, well-behaved youngsters and with normal adults.

From the brains of a large proportion of the problem children, these investigators were able to pick up very slow electric waves, occurring only about two to five to the second. Such slow waves can be picked up from the brains of normal children, but they occur in only a few individuals. Normal adult college students have them only very rarely.



*Science News Letter, September 14, 1940*

## RADIO

Dr. O. H. Perry Pepper, of the University of Pennsylvania Hospital, will talk on Medical Problems of Old Age, as guest speaker on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Sept. 19, 4:00 p.m., EDST, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.



Other abnormalities of the brain waves were found when the problem children were made to take long deep breaths. This "overbreathing" has been observed to start fits in certain epileptics. In more

than half of the problem children, it induced slow brain waves. This peculiar effect of overbreathing occurred in only 21% of the normal children and 6% of the normal adults.

*Science News Letter, September 14, 1940*

# MEDICINE

## Traces Invasion Route of Infantile Paralysis Virus

Can Travel Only Along Axis Cylinders of Gray Nerve Fibers, Ending in Nose, Tongue, and Stomach Lining

**W**HEN infantile paralysis invades a human body, success or failure of the virus blitzkrieg hangs on all-important "ifs." A view of how the disease conquers, gained by anatomical study, was reported to the American Congress of Physical Therapy by Dr. John A. Toomey of Cleveland City Hospital.

To produce the disease, the virus must contact gray-fibered nerves which have naked axis cylinders, into which the virus can be absorbed and thus find transportation to its goal—the central nervous system. Gray fibers which the virus can reach for entry would include nerves in the nasal passages and about taste buds of the tongue, and networks of nerves in the stomach tract.

The disease will strike with more force, Dr. Toomey explained, if the absorption of the virus is rapid, if transmission through the body is quick and easy, if the strain of the virus is virulent, if the nerves are not in healthy condition, or if other factors favor the invading virus. If the distance between the virus' point of attack and the central nervous system is too great, the virus may fail, because it may be absorbed, excreted, or destroyed long before reaching the spinal cord, he stated.

Dr. Toomey was a pioneer advocate of the theory that infantile paralysis can enter the body by being swallowed with water. Received skeptically at first, this idea is now commanding respect.

*Science News Letter, September 14, 1940*

## Diathermy Wavelengths

**D**IATHERMY apparatus used by physicians in giving heat treatments by means of short-wave radio emanations will have their own frequency bands to prevent interference with other radio services, if plans outlined by E. K. Jett, chief engineer of the Federal Communi-

cations Commission, to the Congress are carried out.

Transmissions from electro-medical apparatus have actually been received across the continent and even across oceans, Mr. Jett reported in explaining the interference difficulties caused by diathermy machines. When diathermy interference began to be serious, a number of years ago, the disturbances were at first attributed to stations operated by persons under the jurisdiction of foreign governments. The signals were traced to diathermy machines operated in medical centers and offices of private physicians. One machine was hitched to a telegraph key and signals tapped out in International Morse Code were easily read in Washington, D. C., and Great Lakes, Ill. From 10% to 82% of the channels in use for long distance communication were interfered with at times.

Diathermy apparatus affects radio reception because the machines are essentially radio transmitters, Mr. Jett explained. The radiation that causes interference is not essential for therapeutic purposes and steps are being taken to prevent such radiation. Mr. Jett emphasized that the F.C.C. recognizes the importance of electro-medical apparatus to the medical profession and he assured those present that the government will cooperate fully so that both services may continue without mutual annoyance.

At Inter-American Radio Conferences it was agreed that the various American nations should consider limiting diathermy apparatus to two frequencies in harmonic relation above 12 megacycles which will not interfere with existing radio assignments.

Mr. Jett told the medical men interested in the problem that a conference to bring together all the interested parties will be called in the near future.

*Science News Letter, September 14, 1940*

## Study Weather Effects

**I**F YOUR temper and nerves get more edgy when a storm is approaching, it is probably because the water balance in tissues of your body actually is disturbed due to falling barometric pressure outside.

Advancing this likelihood, Dr. C. A. Mills of the University of Cincinnati College of Medicine advocated that scientists should closely investigate body changes thus involved when stormy weather brews.

Suicides are more apt to occur when a storm center approaches, Mr. Mills stated. Domestic troubles flare up most readily. It is harder to think clearly. Even animals become more inclined to fight, and less reliable.

"With declining outside pressure," he explained, "tissues take up water and swell, much as does a sponge, while with rising pressure they give up water and shrink."

In girth measurements of his own leg just below the knee, he observed changes of half an inch or more with major weather changes, and some people changed several pounds in weight.

*Science News Letter, September 14, 1940*

## Frostbite Warning

**W**ITH winter around the corner, frostbite hazards and treatment were called to the attention of the Congress by Dr. Frank V. Theis of Chicago.

"Individuals with wet clothing, shoes, or gloves are particularly susceptible to the effect of cold weather," he warned.

Temperatures do not have to dive below freezing to cause frostbite, Dr. Theis explained, citing a golf player and a tunnel worker who suffered gangrene of the toes from exposure to wind and wetness in above-freezing weather. This type of frostbite is termed trench foot.

Dr. Theis urged that unless the exposure to cold has been long and extreme physicians who diagnose frostbite should make sure that the patient is not actually a sufferer from some pre-existing circulatory disease. Hardening of the arteries, either the diabetic or the senile form, is frequently overlooked, he has found, and the patient receives unsatisfactory treatment for his case of "frostbite."

Application of heat to an acutely frost-bitten hand or foot is particularly injurious, Dr. Theis emphasized. Often, he said, it leads to rapid mummification of the tissues.

*Science News Letter, September 14, 1940*

## BIOCHEMISTRY

**Nornicotine Identified As Alkaloid in Tobacco**

**Y**OU AREN'T a nicotine addict. You're a nornicotine addict, especially if you smoke a brand that features mildness, as most cigarettes and pipe tobaccos do nowadays.

A U. S. Department of Agriculture chemist, L. N. Markwood, has discovered that in certain modern tobaccos, bred for many years to reduce their nicotine content, the predominating alkaloid is now no longer nicotine but a chemically related compound, nornicotine. (*Science*, Aug. 30). Tried out on laboratory animals, nornicotine proves to have a much weaker toxic effect. In one case it was only a tenth as poisonous as a comparable dose of nicotine.

"From the smoker's standpoint this is fortunate," comments Mr. Markwood.

Tried out in a limited way as an insect poison, nornicotine is fully as effective as nicotine, and in certain combinations even more so. Larger-scale tests of this relatively little known compound may now be made, since a possible bulk source of it has been discovered.

*Science News Letter, September 14, 1940*

## EUGENICS

**Eugenics Seen as Vital To Future of Democracy**

**T**O CONTINUE as a successful democracy, the United States is going to need all the help that the science of eugenics can give.

This, in brief, is the warning of Frederick Osborn, anthropologist of the American Museum of Natural History, expounded in a new book, *Preface to Eugenics*.

It would become increasingly difficult for a democracy to continue to function, if the mass of the people should continue to deteriorate, while the competent people dwindled in numbers. And this is the dangerous situation toward which the United States is seen drifting.

Large families of five children or more are now scarce, except in poor and underprivileged homes in rural areas. Meanwhile, the small family is becoming the almost universal pattern in the United States. At present, 63% of married couples in this country have no children or at most one or two.

Opposing arbitrary control of human breeding as a dangerous tool, Mr. Osborn favors watching Sweden's policy of improving its population. To lighten the

cost of a large family, Sweden has adopted such measures as these: A maternity bonus is paid to lighten costs of childbirth, and 92% of Swedish mothers come within the income bracket making them eligible. Health centers are provided on a national scale for Swedish mothers and children, even to providing in 1939 free cod liver oil, calcium and other preventive medicines. To avoid subsidizing parents, Sweden has emphasized services that the state can render directly to children.

The United States, perhaps partly unconsciously, is launching into a significant population policy, the anthropologist sees. One feature is the increase of the services rendered by the state to parents or children, which lighten the economic burden of a family. The other feature is rapid extension of birth control services. In city populations, the majority of married people practise contraception. Mr. Osborn foresees a more serious attempt to introduce birth control measures among the poorer people, by instruction by physicians and clinics.

Birth control, he emphasizes, should have the goal, not of reducing the nation's population, but of removing an unwanted burden on the poor and ignorant, and providing the advantages of controlled parenthood. Parents in a position to have more children should be encouraged to do so and aided, he maintains, predicting that the federal government will spend continually more money on behalf of the children of the United States.

*Science News Letter, September 14, 1940*

## PSYCHOLOGY

**Female Chimpanzee Uses Superior S. A. on Mate**

**I**DEAL matings are rare among chimpanzees studied by Dr. Robert M. Yerkes, of the Yale Laboratories of Primate Biology. The chimpanzee female is more highly sexed than her mate, and she usually trades on this advantage to win her way with him. The extent to which she "turns on" her sexual allure depends upon how bossy her natural inclination leads her to be.

Dr. Yerkes has observed in his ape pairs a giving up of rights and privileges in what appears to be a recognition of social customs or what corresponds to human ethics. Although either the male or the female may be the boss of the family, the male usually gives up his rule to his mate when she is ready to use her sex appeal.

*Science News Letter, September 14, 1940*

**IN SCIENCE**

## ASTRONOMY

**Whipple's Comet Returns After Seven-Year Absence**

**W**HIPPLE'S periodic comet has been rediscovered after being lost to telescopic sight for about seven years. Originally discovered by Dr. Fred L. Whipple of Harvard Observatory in 1933, the comet has now returned to a position nearer the sun and has been spotted through Harvard telescopes by his colleague, L. E. Cunningham. It is a very faint and diffuse object without any central condensation, located in the south-eastern evening sky in the constellation of Aquarius, the water carrier. The comet is expected to get somewhat brighter but not enough to be seen by the unaided eye.

*Science News Letter, September 14, 1940*

## ARCHAEOLOGY

**Turkey Souls May Have Guided Departed Indians**

**T**URKEYS and dogs found buried in the graves of prehistoric Pueblo Indians in eastern Arizona point to strange beliefs about the afterworld in early America.

That souls of turkeys may have been regarded by these Indians as helpful guides for the human soul on its journey is a possibility suggested by Dr. Frank H. H. Roberts, Jr., of the Bureau of American Ethnology. Aztecs of Mexico looked upon dogs as good guides after death, in this fashion. In one grave of a very small Indian, a dog and a turkey lay at right and left of the child.

Study of human bones in the graves shows that decayed teeth were a common cause of suffering.

"It is probable," Dr. Roberts reported, "that drastic measures were resorted to on occasion to remove aching teeth. One adult was found with all of the teeth missing, and indications were that this had taken place a number of years before death."

Evidence was found that the Indians practised deliberate deformation of infant heads in the transitional period between Basket Maker and Pueblo cultures.

*Science News Letter, September 14, 1940*



# NE FIELDS

## PHYSIOLOGY

### Two State Laws Declare When Driver Is Drunk

THE OLD question of how drunk a drunken driver really is has been settled for at least two states, Maine and Indiana, by legislation.

A driver there is drunk when he has 0.15% of alcohol in his blood.

According to a pharmacological manual, this would mean that he had consumed about one pint of whisky or about 10 bottles of beer.

In Indiana, if a driver has 0.05% or less alcohol in his blood (corresponding to about five ounces of whiskey consumed or about three cocktails) it is considered as evidence that he is not drunk. Any amount between this and 0.15%, is considered relevant but not proof of intoxication. In Maine, the critical point of "relevancy" is 0.07%.

*Science News Letter, September 14, 1940*

## PUBLIC HEALTH

### Mastoiditis in North Blamed on Cold Climate

GREATER prevalence of mastoiditis in the northern part of the United States is due to the cold climate which causes both lowered resistance to and greater virulence of the streptococcus, most common germ in mastoiditis.

This idea is advanced by Dr. Mercer G. Lynch, of New Orleans (*Journal, American Medical Association*, Sept. 7).

Streptococci from different geographic regions and guinea pigs subjected to artificial climates typical of the North, the East, and the South, were used in studies Dr. Lynch made to find why the number of cases of mastoiditis increases steadily from Texas and Florida to Massachusetts and Maine.

The streptococci were subjected to various temperatures of heat and cold such as are found throughout the country and also to sudden changes in temperatures characteristic of certain regions. Those germs from regions having such changes were more resistant than the germs taken from more uniform climates. The germs themselves, therefore, Dr. Lynch concludes, lose some of

their virulence and living powers when accustomed to a more uniform climate. In time, however, those germs that survived the sudden changes became as virulent as the germs accustomed to such changes.

When the germs were injected into guinea pigs living in various types of artificial climates, it was found that the animals living in warmth and sunshine with plenty of calories and vitamins withstood even the most virulent germs from the North and East better than those living in cold climates with little sunlight and limited space for exercise, although this group of guinea pigs were injected with the less virulent germs from the Middle and Southern states.

From these experiments, Dr. Lynch concludes that "those areas of the country where the climate varies markedly, where extremes of cold are encountered and where open air exercise is thus limited, over a period of time the resistance is lowered and the population is thus more susceptible to infection—this, coupled with the fact that the infection gains virulence because there is less in the natural elements to combat and decrease the virulence. By these factors are meant fresh air, sunlight and exercise."

*Science News Letter, September 14, 1940*

## PSYCHOLOGY

### String May Suffice For Future Pasture Fences

A SINGLE string hung between slender posts may be enough to keep the cow of the future in her pasture if cows are psychologically conditioned as suggested before the meeting of the American Association for Applied Psychology.

The conditioning would only mean punishing Bossie with a mild electric shock every time she went near a string. Even a cow soon learns to stay away from all strings after that.

It might be possible to condition a cow so that she would avoid only string of one particular color, say white, which would then be used for the "psychological fences".

Psychology could thus save the farmer the enormous costs of iron fences and electric devices now used. Dr. A. I. Gates of Teachers College, Columbia University, told his colleagues in the course of his address as vice-president of the educational section of the Association.

"Although a farmer neighbor of mine declared this was a daffy idea, it is good psychology," declared Dr. Gates.

*Science News Letter, September 14, 1940*

## MEDICINE—EDUCATION

### Give M.D. Degree Without Internship, Is Suggestion

WHILE serving a year as an intern in a hospital is an important part of American medical training, only 17% of the medical schools of the country now require it before the M.D. degree is awarded, figures issued by the American Medical Association show.

Editorially the *Journal of the A.M.A.* (Aug. 31) takes the stand that "medical schools should not make the internship a part of their requirement for a degree." The difficulty is that the tendency is to make the school or dean responsible for placing its graduates as interns, and having recommended a student for internship in the fall of his final year, the faculty would scarcely dare to flunk him in June.

A change of scene for medical students is recommended by Dr. William Dock of San Francisco in discussing the problem of interns. They should not intern in hospitals in which they took undergraduate training. Medical schools that control hospitals should not select, in his opinion, interns for those hospitals almost wholly from their own graduates, as is often the custom.

Dr. Dock considers that the problem of the fifth year of medical training might be left to state licensing boards, of which 44% now require the intern year before doctors can practise.

Compilations of the A.M.A. show that there are 76 medical schools in the United States and Canada. In the past year 5,703 received the M.D. degree. Students enrolled numbered 24,194, not including interns. One out of twenty of the graduates were women.

*Science News Letter, September 14, 1940*

## ORNITHOLOGY

### Monkey-Eating Eagle Comes to National Zoo

See Front Cover

EAGLES are always an attraction in any zoological park's aviary. So rare that it is doubtful if the average zoo-goer ever heard of it, is the monkey-eating eagle of Africa. The National Zoological Park in Washington, D. C., is fortunate in the acquisition of a pair of these birds, brought back from Liberia by Dr. and Mrs. William M. Mann. They are believed to be the only pair of monkey-eating eagles now on display in this country.

*Science News Letter, September 14, 1940*

## NUTRITION

# America Builds Food Defense

**Food Front on This Side of the Atlantic is Solid,  
While Beleaguered Europe Fears a Winter of Famine**

By EMILY C. DAVIS

**A**MERICA'S food defense is stronger today than it was during the first World War.

That means a lot in a world that does its fighting with butter as well as guns.

"Hungry people, ill-fed people are a liability in a defense program," declared Miss Harriet Elliott in a statement following her appointment as consumers' representative on the President's National Defense Advisory Commission.

That sums up neatly the food angle of this 1940 American defense situation. Remember the 1918 food slogan: "Food will win the war"?

Overseas, Europe looks forward at best to a winter of too little food. At worst the spectral horseman Famine will ride, taking horrifying toll. Chinese and Japanese are stretching supplies, concerned over too little grain.

## U. S. Supplies Best

The United States reassuringly has the best food supplies in the world, and not only the most abundant food, but the most varied. No country on earth is better fed than ours, and probably it would be safe to say that no country is so well fed as ours.

Nutritionists cannot forget for an instant that we do have millions of under-nourished people in this country. There is chronic famine among large numbers of Americans for want of vitamins, minerals, and other precious substances that occur in tiny quantities in foods, so Dr. Tom Spies of Birmingham, Alabama, told the American Medical Association recently. There is too much scurvy, pellagra, and beri-beri among the poor of this country, public health officials declared at the same meeting.

These pale forms of famine do not kill outright. They weaken, and render people unfit. Since they drag down fitness in this land of abundance and scientific knowledge, then it is probably startling, but true, that no great nation in history has ever been really well fed. A report of a nutrition committee of the League of Nations appalled the world in 1937 by revealing malnutrition as worldwide.

Nutritionists, who do not want to see the United States take these conditions calmly, go around worrying over the dark side of the picture. They grade diets from minimum—enough to keep people alive in emergency—on up to liberal. They say that relatively few people in this country have really good diet.

But taking all this into account, the United States is still in a strong position in its food defense, and better off than in 1917.

Here are some reasons:

We have learned a vast deal about eating for strength and well-being since 1917. Most people have probably forgotten that in World War days the average American had not been introduced to vitamins. Laboratory workers were just beginning to discover these minute factors that had lurked unsuspected in food.

Florentine pharmacists are credited with selling lemonade as a scurvy remedy in the middle ages, but they knew nothing of the vitamin C in the citrus fruit that did the trick.

Earlier than that, about 1500 B. C., Egyptians and Chinese hit upon the discovery that eating livers would improve vision in dim light. But the scientific explanation that vitamin A is a protective food factor for night vision did not come for more than 3,000 years, in our own time.

## Vitamin Researches

Success of chemists in isolating the elusive vitamins and duplicating their qualities synthetically has made it possible, within our present generation, for the first clean-cut experiments to be made, showing exactly what a given vitamin does for the body, by showing what lack of it does to blood, or bone, or other tissue.

Unknown in 1917, almost a whole alphabet of vitamins is known to specialists today, and school children glibly tell you that fruits and vegetables and other foods contain the vital vitamins.

The important role of tiny quantities of minerals, such as manganese, tin, and copper, in foods has also been mainly a revelation of the post-World War era.

We are still only at the beginning of

knowledge about human nutrition—so, paradoxically, states the Department of Agriculture's bulky master-volume, *Food and Life*, which brought American nutrition up to date to 1939.

But while nutritionists look forward to greater possibilities in eating for health and happiness, they declare strongly that right now there is enough information to improve health and make lives longer and more useful. What makes them downcast, is the fact that the knowledge gained is far from being used by the public as it might be.

This does not mean that food specialists want you to puzzle your brain over tin and manganese and vitamin B complexes when you dicker with the butcher or order a restaurant dinner. If you manage to eat as large a proportion of the protective foods as you sensibly can, you will probably be getting a well-balanced diet. These protective foods, that figure so large in America's food defense, are the fresh vegetables and fruits, milk and its products, and eggs.

A diet that contains at least 50% of protective foods has been commended



## VITAMIN TROOPS

*Digging in the home garden, where vegetables produce most of the needed vitamins, is just about the best defense a family can put up against the most insidious of foes, malnutrition.*

as what America should have, by Dr. Henry C. Sherman, Columbia University chemist and authority on vitamin and mineral requirements. This would represent a major shift in the food habits of our people, nutritionists say. The trend is already in this direction.

At present, Americans get less than 30% of protective foods, making up over 70% of their food from grains, meats, sugars, potatoes, fats other than butter, and mature legumes. Before the World War, they were eating an even larger proportion of the latter foods—80%.

### Nutrition-Consciousness

There is plenty of evidence that Americans are more nutrition-conscious now than they were back in 1917. Home economics is a flourishing subject in high schools and colleges. Nutritionists, and nutritionists' organizations have increased in numbers. Almost every health organization has its staff member who understands food problems.

Housewives are more astute grocery shoppers, increasingly aware that it is smart to read labels and to get their money's worth. Even children in some schools make laboratory experiments and do comparative shopping, with a view to becoming efficient consumers.

A sample of the widespread interest in better balanced eating: A farmer's bulletin such as Dr. Hazel Stiebelling's *Diets to Fit the Family Income*, which the government distributes through requests to the Bureau of Home Economics, Department of Agriculture, is a federal "best seller" with a record of over half a million copies asked for.

That Americans are profiting by what they learn is indicated by a shift toward the protective foods. In a new study of how people with moderate incomes spend their money, Dr. Faith Williams of the U. S. Bureau of Labor Statistics has learned that people of this class bought for instance, more milk, oranges, lettuce, spinach, and canned tomatoes in 1934-1936 than similar families did in 1917-1919. The tomato juice and grapefruit juice consumption in these families was larger in 1934-1936. They bought many other foodstuffs in 1934-1935 that were not on the market or in reach of people with moderate incomes back in World War days.

"Striking changes," Dr. Williams calls the shift in food expenditures of American wage earners and clerical workers. She attributes it to the awareness of minerals and vitamins and their importance, to lower food prices in general and lower prices of some of the nutritionally valu-



### FOOD HELPED WIN A WAR

*This was in 1917, when a group of War Department experts examined foods intended for the Army. Newer knowledge gained since then makes the work of similar bodies nowadays much more efficient.*

able foods in particular, and to the fact that fresh fruits and vegetables are now more available all the year round.

But what about the set-back that American nutrition suffered when economic depression set in in 1929, and unemployment threw families on relief, and droughts of 1934 and 1936 turned farms into dust bowls?

Surprisingly, at least one conservative nutritionist suspects that the set-back may not have been so serious as is supposed. The emergencies spurred agencies, governmental and others, to rapid and renewed efforts to feed the hungry and to ward off malnutrition diseases.

Over a million needy children a day fed hot lunches by WPA workers at 11,000 schools over the country, has been one answer to the threat of malnourishment among the children. Over 2,500,000 young men enrolled in the CCC camps have been put in physical fitness, fed on the garrison ration of the Army—and our Army likes to boast that it is the best fed in the world. The average CCC boy gains 7 to 12 pounds in the first six months in camp, has been the usual report. In addition, there have been such projects as the WPA work of canning large quantities of foods, of teaching people to plant vegetable gardens.

The appropriation by Congress of

funds to buy surplus commodities, thus taking surplus food off the farmers' hands and making it possible for relief families to buy at low prices is another line of nutrition defense. The food stamp plan, now operating in over 100 areas, and requested by nearly 1,000 communities, is for the first time making it possible for people on relief to do what dietitians so urgently advise them—buy more protective fruits and vegetables in season, and less proportionately of the important but heavily starchy foods.

Former Secretary of Agriculture Wallace has estimated that American consumption of butter will be increased 56,000,000 pounds in a year, and eggs 59,000,000 dozen, by the stamp plan buying, which now is available to 1,500,000 people. In addition, a good many of these Americans are getting a nutrition lesson, as they become conscious for the first time of what a broader diet is like, and learn from leaflets—handed out with the marketing—what foods they need.

The surplus milk plan, enabling relief families to buy milk at five cents a quart, is another of the government efforts to build nutrition, while aiding farmers. Tried experimentally first in Boston, the surplus milk plan has been expanded to several other cities.

Should the United States need to mo-



bilize against invasion it would benefit by experiences in feeding large groups. Not a pretty thought, nevertheless it cannot be overlooked. Such projects as preparing lunches for children on relief, and the Red Cross feeding of thousands made homeless by Mississippi floods and other disasters, are a form of preparedness. The WPA alone has trained 36,000 workers in cooking and serving school lunches.

The British were told by food officials last autumn to dig for victory. Meaning that they were to plant gardens to stretch the home-grown food supplies. While the United States now has surpluses, there are places in this country where home gardening is filling a special nutritional need, and is being expanded. Some of the plantation owners in southern states are requiring tenants to cultivate gardens, and some plantations operate a community garden, where tenants may obtain a variety of food at small expense.

Gardens are a means of warding off pellagra, a disease which Public Health Service officials say occurs among 100,000 people in the South each year. It plagues the poor who live mainly on corn as cereal food.

#### Gardens For Vitamins

A garden patch carefully planned can fortify a family with an impressive array of the vitamin-rich fruits and vegetables, plus vitamin D gained from the sunshine while working the patch.

Precisely measuring the advance of American nutrition since 1917 is a problem in fine figures that stumps statisticians. They can tell you readily that 468 draft men out of 1,000 in World War days had some physical defect. It was easy to count the number of men with flat feet or weak eyesight. But no special effort was made to detect the obscure physical conditions due to eating the wrong kind of food, or too little. As has been said, less was known about nutrition, then. It was not until post-World War times that nutritionists gave up laying heavy stress on charts decreeing a proper weight for each height. They learned that a person might be heavy enough or even over-weight, and still be starving for want of some food factor essential to sturdy well-being.

It was not known in 1917 what people in different parts of the United States ate, though it was familiar knowledge that the dinner tables of New England differed from those of the South or Midwest. Lack of this information was a problem for American food officials, when they set about rationing supplies in war days.

*Science News Letter, September 14, 1940*

#### VETERINARY MEDICINE

## Swine Erysipelas May Infect Human Beings

### American Veterinary Medical Association Meeting Hears of Many Advances in Keeping Animals Healthy

**E**RYSIPELAS in one form can be "caught" from pigs by human beings, Dr. Glenn S. Everts, Philadelphia physician, stated before the 77th annual meeting of the American Veterinary Medical Association, held in Washington, D. C., Aug. 26 to 30.

Swine erysipelas is caused by a germ that is found practically everywhere and is exceedingly hard to kill, said Dr. Everts. It occurs wherever nitrogenous substances are decaying, and can grow in the soil without contact with a living animal host. It resists the processes commonly employed in processing pork, such as boiling, salting, pickling and smoking.

In swine, the disease manifests itself in three forms; mild, acute and chronic. The mild form is fairly common in human cases, the other two rather rare. In one pork packing plant that came under Dr. Everts' observation, 2% of all employees who handled the product developed symptoms.

Infection always starts in some slight break in the skin of the hand. Pain is the first thing noticed, followed by swelling and reddening. The infection usually tends to spread, although it rarely goes beyond the wrist, except in unusually severe cases. The disease runs its course in about three weeks. About a fourth of the men attacked lose from one day to two weeks of working time.

*Science News Letter, September 14, 1940*

### Parentage Tests For Cattle

**C**ASES of disputed human parentage get into the courts occasionally, and when they do they are usually page one news because of the drama involved. Doubtful parentage among animals may be of importance, too, because of loss in cash value if the wrong strain has entered into the pedigree.

Blood tests can be used to settle paternity questions among cattle, Dr. Lloyd C. Ferguson of the University of Wisconsin told the meeting. Procedure, however, is not the same as in human cases. Human paternity is decided on the basis

of blood types, such as are used in "matching" blood for transfusions. In cattle, the things used are antigens—definite chemical entities in the blood that react in the presence of one particular substance.

Cattle blood has been shown to possess something over 20 such antigens, each dependent on a single hereditary character or gene. Not all of these antigens are present in the blood of any one animal, but a characteristic pattern, almost as definite as the spectrum of an element, marks a given strain of descent. By matching these antigen patterns it is possible to tell whose calf is whose.

*Science News Letter, September 14, 1940*

### Brucellosis Vaccination

**V**ACCINATION can protect cows against the serious disease, brucellosis or contagious abortion, which causes heavy money losses to farmers and stockmen, Prof. C. M. Haring and Prof. Jacob Traum of the University of California reported before the Association.

The vaccine consists of a suspension of weakened germs, which are related to the cause of Malta fever or undulant fever in man. Protection with this vaccine has been conferred upon large numbers of animals over a period sufficiently long to justify the belief of the two researchers in its efficacy.

They reported comparative observations, on vaccinated and unvaccinated cattle: "Data show that 2,872 parturitions of vaccinated animals yielded 94.1% normal calves, whereas 1,763 parturitions of the older nonvaccinated cows in these dairies, including both negative and reacting animals, resulted in only 86.1% normal living calves."

The vaccine is administered to heifers while they are quite young, and usually gives protection until the first calf is born. Protection is not absolute: too close association with infected cows during the last six months of pregnancy may cause the loss of the calf.

*Science News Letter, September 14, 1940*



### BARNYARD INVADES BALLROOM

For the first time in its glittering history, the grand ballroom of the Mayflower Hotel in Washington, D. C., resounded to hoofbeats, when a horse, a cow and a sheep were led into it during the recent meeting of the American Veterinary Medical Association, for a demonstration of new apparatus and methods in animal clinics.

### Trichinosis Tests Criticized Rat Germs Kill Eggs

**T**ESTING swine for trichinosis by means of skin reactions is not yet in the category of proven successes, Dr. Benjamin Schwartz of the U. S. Department of Agriculture told the veterinarians. One trouble with the tests thus far proposed is that while they may show up on a nice, fresh, smoothly pink-skinned pig, they aren't distinct and sharp enough to stand out on the wrinkled, rough, mottled hide of a veteran porker at the sudden end of a hard life.

Skin tests have been found somewhat ambiguous, in repeated trials in the Bureau of Animal Industry, Dr. Schwartz reported. Sometimes they fail to show up on hogs subsequently demonstrated to be trichinous by post-mortem examination, while animals without trichinae have given positive reactions in many cases.

A more positive test, with results easy to detect under ordinary packing-house inspection conditions, is still to be discovered, Dr. Schwartz insisted.

*Science News Letter, September 14, 1940*

**R**ATS can be enemies of turkeys in more ways than simply stealing their eggs and killing their chicks. They can be carriers of disease germs that kill the helpless embryos before they have a chance to hatch, it was shown in experiments by Dr. R. Fenstermacher and Dr. B. S. Pomeroy of the University of Minnesota, reported before the meeting.

In the experiments, batches of eggs were smeared over about a third of their surfaces with a preparation containing live germs of mouse typhoid, a common and frequently fatal disease among mice and rats. Then they were put into incubators to hatch. A good many of them never did, and of the young birds that finally came out, a good many died.

Post-mortem examinations of the chicks that died, both before and after hatching, disclosed the presence of the mouse typhoid germ in a high percentage of cases.

*Science News Letter, September 14, 1940*

## A new book SCIENCE PICTURE PARADE

by Watson Davis,  
Director of Science Service

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## ECONOMICS

# Challenge Price Boosts, Is Advice to Consumers

**No Significant General Rise in Prices Yet Reported;  
Shortages in Consumer Goods Have Not Developed**

**I**F YOU hear rumors of shortages in everyday commodities, or if prices of goods take a queer upward rise, don't be gullible. Ask why. And weigh carefully the reasons offered.

This is advice from Dr. Ben Lewis, chief economist in the office of the Consumer Adviser of the National Defense Advisory Commission, to consumers who are wondering:

Just exactly what is a consumer expected to be doing these days about national defense?

Retailers' problems are being threshed out in a retailers' conference in Washington, D. C., called by Miss Harriet Elliott, Consumer Adviser on the Council of National Defense Advisory Commission. The more successfully Miss Elliott's liaison office can work with shop owners and others who supply consumers' everyday needs, and the more easily the market adjusts itself to the stresses and strains of total United States defense, the less the public will probably have to bother over the consumer problem of defense.

For the present—

"There has been thus far no significant general rise in prices," says Dr. Lewis. "We know of no shortages as yet in consumer goods."

Consumers, therefore, may as well shop normally, expecting no more than the usual seasonal changes in price, or fluctuations due to ordinary supply and

demand. Nor have they any need to scurry around storing up shoes and blankets, squirrel-fashion, in response to vague and airy rumors that this or that useful article may be pretty scarce. In fact, such "scare" buying is likely to induce the very condition the consumers' office is trying to forestall. Usually, these rumors are based on half-facts. If British woollens prove hard to get, due to some increasing difficulties in foreign transport, it does not follow that wool from other sources cannot be provided.

Dr. Lewis sees the work of the Consumer Adviser's office as the positive job of keeping open the flow of commodities required for civilian defense, not as the negative job of snapping at the heels of industry and business groups who are trying to turn out goods for the defense program. The office is trying to keep track of the supply, demand, price, and production capacity situation in a wide range of commodities and services that affect the general public. It has a watchful eye out for, and is gearing itself to avert, unnecessary shortages and price spiraling. In some instances, huge Army orders for some article of clothing can be spaced out, instead of turned out on very short order, thus allowing factories to keep up civilian supplies as well.

"In a country with the unemployed resources of ours," says Dr. Lewis, "we should be able to take care of full civilian and military needs for total defense. Situations may occur when the Army will need instant material, and civilians will have to wait. But in general, we expect to see that people have enough goods and services to keep up morale and to meet any emergency."

*Science News Letter, September 14, 1940*

## INVENTIONS

## New Machine Gun Able to Change Rate While Firing

**A** MACHINE gun in which the firing rate can be varied while in action has been invented by Robert H. S. Hughes, of Baltimore, Md. A series of five patents has been granted to him for

weapons operating on the same principle. By means of an attachment to the muzzle of the gun some of the gases that would normally emerge immediately following the bullet are diverted through openings and directed to the rear at an angle of about 45 degrees to the barrel. Thus, they are not squirted at the gunner, and their force is exerted in a direction to counteract the kick.

The first four patents cover various aspects of the device as applied to any gun. The fifth relates to its application in a heavy machine gun, of the type of the Browning, in which the recoil changes the cartridge. Here the ports through which the gases are ejected can be opened or closed by the gunner through a flexible shaft extending to the breech. As this is adjusted, tension is changed on the spring which returns the barrel to position after the insertion of the new cartridge. Thus, the gunner can alter the rate of firing without stopping, a feat not possible in conventional machine guns.

*Science News Letter, September 14, 1940*

## VETERINARY MEDICINE

## Critical Tests Made on Sulfapyridine For Cows

**C**OWS no less than humans will presently be receiving the benefits of the new chemical germ-killers of the sulfanilamide group. Tests of the closely related chemical, sulfapyridine, were reported by a three-man research team from the University of Pennsylvania, Dr. Louis A. Klein, Dr. Albert L. Kleckner and Dr. Robert O. Blitz.

They gave doses of varying strength to a number of cows. There was nothing the matter with the cows: the object of the experiments was to see how much of the drug had to be administered to raise the blood content to a germ-killing concentration, and also to see if any untoward effects would develop. For these experimental purposes it was better to work with healthy animals than with sick ones.

The doses varied from four to nine grams per hundred pounds of body weight. Even with the smallest dose, a germ-killing sulfapyridine concentration was found in the cows' blood within 48 hours. The cows didn't take too kindly to the dosing. They lost appetite, and the amount of milk was reduced. One cow developed a skin rash. However, all these difficulties cleared up within a couple of days.

*Science News Letter, September 14, 1940*

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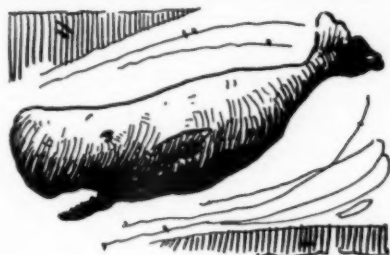
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BIOLOGY

## NATURE RAMBLINGS

by Frank Thone



### Invisible But Important

**I**SN'T IT ODD, how all animal life in the sea is dependent on tiny plants invisible to the naked eye!

Vast mountains of these algal cells are accounted for in the more usual cycles of eat-and-be-eaten represented by practically all fish, crustaceans, dolphins, seals, whales, as well as less familiar creatures such as jellyfish, starfish and sea urchins, octopuses and cuttlefish—all the larger carnivora and scavengers that swim the sea and crawl on its bottom.

Each of these creatures eats other animals a little smaller than itself. These in turn prey on still others that are a step smaller, until at last we get down to the ultimate feeders on the one-celled algae—animals that are microscopic themselves. There may be a dozen or a score of digestive steps between diatom and whale.

That pyramiding of hungers holds true specifically for the sperm whales, the only whales that eat really large bites. With their enormous jaws and stumpy teeth as big as pint jars, sperm whales rend and devour the pink flesh of the giant cuttlefish that live in the great, dark depths. These cuttlefish are in turn devourers of anything they can touch with their anaconda-like arms, including many really large fish. The big fish in turn are eaters of smaller fish, and the smaller fish feed on still smaller ones. The smallest fish eat tiny shrimp-like creatures, marine worms, swimming mollusks, and so on. These, finally, make the ultimate food-demand upon the one-celled algae, the humble grasses of the sea.

Whales, partly because of their huge size, partly because of the mystery that still surrounds much of their lives, give dramatic emphasis to the struggle for food, the compounded tragedy of eat-and-be-eaten that goes on incessantly in the sea. But it must be remembered that on

smaller scale it is repeated in the life of every fish down to the smallest minnow, every squid and cuttlefish, every oyster and clam, every sea animal that eats other sea animals.

Hence the anxious preoccupation of sea scientists with the microscopic algae. With all the care and ingenuity that agronomists bestow on questions of soil fertility, rainfall, growing temperatures, and all other factors that make for success or failure in the production of land crops and pastures, the oceanographers study the conditions that influence the lives of these humble plants that are the foundation of whatever men take out of the sea with hooks, or nets, or harpoons.

*Science News Letter, September 14, 1940*

PLANT PHYSIOLOGY

### Green Plants Give Off Faint Red Radiation

**F**LASHING a red light usually means "Stop!" But when a green plant does it, the flash means "Food-making being speeded." This discovery has been announced in a new publication by Dr. E. D. McAlister and Dr. Jack Myers of the Smithsonian Institution.

The red flash in question is not visible to human eyes, because it is masked by the intense green reflected by the plants when light shines on them—and they can not form food except with the aid of visible light. To see the red flash, which is only a tenth of a per cent of the total light absorbed by the plant, special filters and light-sensitive instruments have to be used. The only way that human eyes could be imagined as seeing the red flash would be by having them totally color-blind to green and hypersensitive to red. So far as is known, this never happens.

The red light is of the kind known to physicists as fluorescent. Fluorescence occurs when certain substances, irradiated with light of a certain color, give off light of a different color. Until the two Smithsonian researchers devised their apparatus and perfected their technique, the relation of this red fluorescence to the food-making process was not known.

One result of the investigation was the demonstration that there is an "anti-photosynthetic" action in at least some plants, that works to hinder or limit the food-making process, even in the presence of the light necessary for it to proceed. They demonstrated this process in young wheat plants, and have indications that it goes on in other species also.

*Science News Letter, September 14, 1940*



## WHAT IS YOUR ALLERGY?

... and what can you do about it—NOW?

An estimated 2,000,000 hay fever sufferers literally sneeze away from one to five months of every year. Countless more are periodically the allergic victims of rhinitis, asthma, hives, eczema, etc. Allergy is no laughing matter—cases range from extreme discomfort to death. Children with untreated allergic sensitivity can become seriously maladjusted to later life. Do YOU know what can be done about *your* allergy—or that of other members of your family—*now*?

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# •First Glances at New Books

## AERONAUTICS

**AERONAUTICAL DICTIONARY AND REFERENCE LIBRARY**—Randolph Hartley, Jr.—*DeVoss*, 524 p., \$4. This useful work is divided into two parts and an appendix. Part one, "Definitions", has fourteen chapters, dealing with different phases of aeronautics, each with its set of definitions. Though the index makes it possible to locate any definition, one wonders why this style was chosen, rather than a straight alphabetical list. In part two, "Reference," there is information about engines, etc.; while the appendix contains a directory of manufacturers and schools, as well as a summary of government regulations.

*Science News Letter, September 14, 1940*

## ENGINEERING

**THE STORY OF A DAM**—Geraldine LeMay—*Longmans, Green*, 66 p., illus., \$1.50. A non-technical description of the building of a dam, told primarily for children of upper grammar school age, and based on the author's own experiences with the T. V. A. The numerous illustrations are beautifully reproduced in aquatone.

*Science News Letter, September 14, 1940*

## GENERAL SCIENCE

**MARVELS OF THE MODERN WORLD**—Harold Wheeler, ed.—*Halcyon House*, 448 p., illus., \$1.98. Twenty-five closely packed chapters, heavily illustrated, covering all sorts of subjects from airplanes to oil. Of pre-war British authorship.

*Science News Letter, September 14, 1940*

## ECONOMICS

**DO YOU KNOW LABOR? FACTS ABOUT THE LABOR MOVEMENT**—James Myers—*Nat'l Home Library Foundation*, 139 p., 50c. The author is industrial secretary of the Federal Council of the Churches of Christ in America. This volume is evidently intended as an interpretation of labor for Church affiliates and is very readable.

*Science News Letter, September 14, 1940*

## WAR—ECONOMICS

**M-DAY, If War Comes, What Your Government Plans for You**—Donald Edward Keyhoe—*Dutton*, 95 p., \$1. If you have a half-finished house, the Government may call off the carpenters, perhaps even commandeer the lumber, to build a cantonment. If you are a young fellow itching for front-line action, you're likely to be told to stick to your lathe

or riveting hammer. If you are a lingerie manufacturer, you may find your silk supply detoured into a parachute plant. These and similar situations are described in vivid narrative form. Evidently, if we get into war it isn't going to be pleasant or profitable for anybody.

*Science News Letter, September 14, 1940*

## GENERAL SCIENCE

**FRENCH-ENGLISH SCIENCE DICTIONARY**—Louis De Vries—*McGraw-Hill*, 546 p., \$3.50. First aid to the scientist who stumbles over a word or two in a French scientific article. This book is a companion to the German-English Science Dictionary from the same collaboration at Iowa State College, the author having had the help of the graduate faculty. Happily many verb forms and idioms are included, which is very helpful to those of us who have forgotten the tables of irregular verbs. If there were only more French scientific articles to read these days!

*Science News Letter, September 14, 1940*

## BOTANY

**ELEMENTS OF BOTANY** (3rd ed.)—Richard M. Holman and Wilfred W. Robbins—*Wiley*, 392 p., illus., \$2.75. New edition of one of the best known botany textbooks now on the market.

*Science News Letter, September 14, 1940*

## BIOLOGY—STATISTICS

**INTRODUCTION TO MEDICAL BIOMETRY AND STATISTICS** (3rd ed.)—Raymond Pearl—*Saunders*, 537 p., illus., \$7. Much new material, as well as revision of old, marks this new edition of a work of proved usefulness to workers in the medical and public health fields.

*Science News Letter, September 14, 1940*

## BIOLOGY

**FUNDAMENTALS OF BIOLOGY, ANIMAL AND PLANT** (2d ed.)—William C. Beaver—*Mosby*, 889 p., 301 text illus., 14 color plates, \$4. New edition of a textbook that has won the approval of those who have used it.

*Science News Letter, September 14, 1940*

## ENTOMOLOGY

**OUR INSECT FRIENDS AND FOES**—William Atherton DuPuy—*Winston*, 284 p., \$1. A new printing of an elementary book about insects (not a textbook) by a successful science popularizer.

*Science News Letter, September 14, 1940*

## ENTOMOLOGY

**ABOUT SPIDERS: INTRODUCING ARACHNE**—Elaine V. Emans—*Dutton*, 183 p., illus., \$2.50. A simply written, simply illustrated, easily understood, popular account of one of the most misunderstood and unjustly persecuted of familiar animal groups. A reading of this book by children still mentally plastic should prove a good preventive of the "arachnophobia" which is all too common an ailment of the present generation of adults.

*Science News Letter, September 14, 1940*

## NATURAL HISTORY

**YELLOWSTONE NATIONAL PARK, Historical and Descriptive** (Rev. ed.)—Hiram Martin Chittenden; Rev. by Eleanor Chittenden Cress and Isabelle F. Story—*Stanford Univ. Press*, 286 p., illus., \$3. One of the classics of National Parks literature, originally written nearly 50 years ago, brought down to date in a complete revision by two writers who know the Yellowstone, both past and present, most thoroughly.

*Science News Letter, September 14, 1940*

## GEOLOGY

**OIL IS WHERE YOU FIND IT**—Sam Mims—*Marshall Jones*, 236 p., \$2.50. Semi-fictional account, written in the rapid, excited style of a novel, of what happens when oil is "brought in." The book contains but little technical information, but it certainly gives a lively picture of the effect of Oil on Folks.

*Science News Letter, September 14, 1940*

## PLANT PHYSIOLOGY

**THE TIME COURSE OF PHOTOSYNTHESIS AND FLUORESCENCE OBSERVED SIMULTANEOUSLY**—E. D. McAlister and Jack Myers—*Smithsonian Inst.*, 37 p., 15c. (See page 174.)

*Science News Letter, September 14, 1940*

## EUGENICS

**PREFACE TO EUGENICS**—Frederick Osborn—*Harper*, 312 p., \$2.75. (See page 168.)

*Science News Letter, September 14, 1940*

## BACTERIOLOGY

**GENERAL BACTERIOLOGY**—D. B. Swingle—*Van Nostrand*, 313 p., \$3. A textbook well designed for use in beginning courses in bacteriology. The review questions at the end of each chapter should help materially in keeping the student "on his toes."

*Science News Letter, September 14, 1940*